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ABSTRACT

This paper presents data documenting gender differences in preschool exceptional education placement for a large metropolitan school district (Tampa, Florida). Research is reviewed in the areas of biological and physiological gender differences, psychological gender development, and sociological influences on gender based developmental outcomes. Data for the school district indicate that boys are entering special education at overall gender ratios of nearly two to one, with significant gender differences found in all program areas. These findings are compared with similar findings on a national level. The importance of ensuring that individuals who evaluate young children are aware of gender based learning issues is stressed. (Contains an annotated bibliography of 57 references.) (DB)

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Bad Boys, Good Girls: A Review of the Research on Gender Differences in Preschoolers and a Reexamination of Assessment, Child Rearing, and Educational Practices

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In this paper, data are presented documenting preschool exceptional education placement statistics by gender for a large, metropolitan school district (currently the twelfth largest district in the nation). Research is reviewed in the areas of biological and physiological gender differences, psychological gender development, and sociological influences on gender based developmental outcomes. The importance of awareness of gender based learning issues is noted for assessors of young children, teachers, and parents.

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The disparate referral and placement of large numbers of young boys as compared to young girls in special education classes demands attention, if not explanation. The purpose of this paper is to discuss the numbers of girls and boys placed in varying special education classes in one metropolitan area as well as in the nation. Important physiological, psychological, and sociological facets of this complex phenomenon are addressed in brief as thorough review is beyond the scope of this paper. The authors wish, as the major goal of this paper, to inspire further questions and an increased awareness of the far reaching impact of gender as a developmental force.

The authors are all members of pre-kindergarten assessment teams in the Hillsborough County Schools in the Tampa area, representing the disciplines of social work, psychology, and communication disorders. In reviewing data gathered from a first year pilot team assessment project (1990-1991), the authors noticed that far more boys than girls were being referred for and placed in special education

classes for preschoolers. There did not seem to be a noticeable pattern regarding specific area of disability.

Further analysis of current team data, and review of statistics from other assessors, larger geographical areas and other ages were strikingly similar. Boys are entering the special education ranks at overall ratios of nearly two to one.

In Table 1 the data are presented for Team I representing the 141 children referred for evaluation from January 1, 1992 to February 28, 1993 in Hillsborough County, Florida. Of the 141 children referred, 92 were boys and 49 were girls. This creates a ratio of 187 boys to 100 girls. All future ratios will be presented by convention as the number of boys per 100 girls. The ratio of boys placed in special education classes was 177:100. Three boys were placed in classes for specific learning disabled children, while one girl was placed. Twenty boys were placed in classes for the emotionally handicapped, while three girls were placed. Twenty-two boys were recommended for service from speech and language programs compared to nine girls. Ten boys were

placed in programs for the mentally handicapped versus eight girls. Five boys were identified as hearing impaired and one hearing impaired girl was identified. Seven boys and five girls were physically impaired. Nine boys were recommended for regular programming and two of the girls referred were recommended for regular programming. The remainder were projected for programs but had not yet been staffed.

Data from a second team of professionals representing the same disciplines as the first team are presented in Table 2. This team evaluated 119 children from January 1, 1992 to February 28, 1993. Overall ratios were slightly higher than for the first team. The ratio of boys referred was 213:100 and of boys placed 224:100. This again represents roughly double the number of boys being referred and placed for exceptional student preschool programs compared to girls. Three males were placed in programs for the specific learning disabled as was one girl. Six boys were placed in programs for emotionally handicapped youngsters compared to four girls. Speech and language services were required by 24 boys and 12 girls.

Twenty-seven boys were placed in programs for the mentally handicapped while nine girls were placed. Two hearing impaired boys and one hearing impaired girl were evaluated and seven boys were physically challenged compared to five girls. Regular programs were recommended for five boys and four girls.

A third team in Hillsborough County evaluated 93 children, of whom 68 were boys and 25 were girls. In Table 3, ratios are reported which were even more clearly higher for young males (referred 270:100, placed 270:100). One boy was identified as specific learning disabled and three boys were identified as emotionally handicapped. No girls were placed in either category on this team. Eleven boys required speech and language services compared to four girls, and 12 boys earned scores in the mentally handicapped ranges compared to eight girls. One girl was hearing impaired (0 boys), and two boys were physically impaired compared to one girl. Thirty-eight boys were projected for special education placements compared to 12 girls, although programs had not yet been specified.

While some teams placed higher numbers of children in some programs over others, all teams placed considerably more boys than girls. The reasons for the higher numbers of specific program recommendations are related to specific team assignments, i.e., working with preschools such as United Cerebral Palsy's preschool that serves predominantly physically challenged children or working with preschools with predominantly mentally handicapped populations. What is not explained is the high proportion of boys to girls. The combined ratio for all children referred to all three teams was 215:100 (boys:girls).

The above ratios are not expected given the ratio of male to female live births over the last decade which is approximately 105:100 (U.S. Bureau of the Census, 1992, p. 65). The above ratios are not explained by local geographic area, as the ratio for all special education children in the state of Florida during the 1991-1992 school year, in all exceptional education programs from pre-kindergarten ages through graduation, was 212 boys to 100 girls. The above ratios are also not explained by the age of the children. The Office

of Special Education and Rehabilitative Services (OSERS), in the fourteenth annual report to Congress, reported numbers by gender of all youths between the ages of 13 and 21 with disabilities. The overall ratio for all disabilities was 217 boys to 100 girls. OSERS concluded that boys are overrepresented in special education, but cautioned that reasons for this are unclear, yet possibly related to male vulnerability or sex bias in the diagnostic evaluation and classification of students (OSERS, 1992).

Biological and Physiological Differences in Gender and Ability

Once these consistently higher ratios of boys to girls in exceptional education in all programs and at all ages are examined, the question that arises is "why?" and perhaps more importantly, "can anything be done to change this phenomenon?" To begin to look for answers, some knowledge of existing biological and physiological gender differences is helpful.

Male biological vulnerability is well documented. More males are conceived, but the male infant mortality rate is higher. Male

fetuses have been found to be more susceptible to spontaneous abortion and stillbirth. Complication rates during pregnancy are higher for boys than girls.

The births of males take an average of an hour longer than births for females. Length of labor has been shown to be more predictive of later problems in infant and toddler behavior than drugs given to delivering mothers (Jacklin, 1989).

There are some data to support the hypothesis that development and maturation occur more slowly in males. Findings have suggested that a newborn girl is the physiological equivalent of a 4 to 6 week old boy and that this developmental disparity continues for some time (Gualtieri and Hicks, 1985). The interval of susceptibility to seizures originating in the temporal lobe as a consequence of cerebral injury is longer in male infants.

Males have a higher rate of affliction for all neurodevelopmetal disorders. However, while more males present with disorders, females are more severely impaired when they are afflicted (Gualtieri and Hicks, 1985). Researchers in the field of genetics explain that the severity and

specificity of afflicted females is an indication that the etiology is genetic. Male disorders are more diverse with a wider range of severity suggesting that perinatal problems are more likely the causal factor. The clinical presentation of a disorder that is largely mediated by the genotype is likely to be more specific. Behavioral and developmental sequelae of early brain damage are known to be relatively non-specific.

Gualtieri and Hicks (1985) have suggested that maternal imunoreactivity to fetal male specific antigens is responsible for the higher frequency of central nervous system disorders in males. Their findings have raised much controversy. A less dramatic, but more popular explanation for increased male vulnerability is a genetically based etiology involving basic differences in X-Y chromosomes, but the research until very recently has only been conducted with animals. Researchers have been cautious about attributing findings in rats to human subjects in the area of gender differences. Sex steroid hormonal differences are most often suggested to be the most common biological cause given for

physiological and behavioral differences. Circulating hormones such as testosterone and androgen are thought to program the fetal brain. Little is currently understood about the relation between adult levels of hormones and those in early life when abilities appear to be organized in the nervous system. Hormonal effects are not just limited to sexual or reproductive behaviors, but also appear to extend to other behaviors in which males and females differ. There is some evidence that they may also effect problem-solving, aggression, and even the tendency to engage in rough and tumble play (Kimura, 1993).

There has been much speculation that male and female brains are somehow structurally different. The male brain is often described as being more lateralized, meaning that one hemisphere, the right, is more dominant. Parts of the corpus callosum, the major neural system which connects the two hemispheres, have been found to be more extensive in females. Currently, however, the roles hemispheric specialization and the size of the corpus callosum play in determining a person's

mental abilities are not clearly understood (Tavris, 1992).

When reviewing the research on physiological gender differences one may expect to find more references to different rates of myelinization by gender. Myelin is the substance that develops as a sheath around the nerve fibers in the brain. Data about different rates of myelinization for normal and abnormal brain development are reported, but no overwhelming evidence that there is a significant difference between males and females was found. Possible misconceptions may have come out of information reported over the years in the media and in other less scientific sources.

While there are some empirical data to support differences in boys and girls, there may also be myths which need to be dispelled. Data that provide complex or non-stereotypic findings are not popular in the lay press as they do not make good copy or sell well. Unfortunately, most people get their ideas about gender differences from what they see or hear in the media. Information found in popular magazines or on

television does not always provide adequate coverage of complex scientific findings. Taken out of context any one piece of information becomes meaningless and certainly misleading. Researchers sometimes rely on weak data to support their theories. Hypotheses that fit popular beliefs about gender may receive more attention and credibility than they warrant. Some ideas creep into our common vocabulary as proven facts.

One example is the popular myth exaggerated by the media in the early 1980s that gender differences exist in math ability. The most commonly referred to phrase being simply "boys are better at math than girls." There are no real biological data to support this statement. Instead, math anxiety, gender-stereotyped beliefs of parents and interestingly, the perceived value of math to the student would seem to account for any sex differences in math achievement (Jacklin, 1989).

Gender is not an important variable in the measurement of intellectual abilities either. There are some earlier reviews of studies comparing male and female performance on

intellectual tasks which did find sex differences in verbal behavior and spatial skills, but current research does not. Sex differences in hemispheric specialization have been suggested, but the data for children are contradictory (Huston, 1983). Actually, there have been decreases in gender differences for a variety of intellectual abilities during the past several decades (Feingold, 1988). Research, primarily with adults, presents instead a pattern of abilities which can differ for men and women, rather than any significant difference in global cognitive functioning.

Women have performed better on tests of perceptual speed in which subjects must quickly identify matching items. Women have also been shown to better remember whether a series of objects or an object has been displayed (landmark memory). Women outperform men on precision manual tasks such as placing pegs in holes and on some measures of verbal fluency and mathematical calculation (Jacklin, 1989).

Men have performed significantly better than women on tasks involving mentally rotating an

object in space or determining where the holes on a folded piece of paper will appear when the paper is unfolded. Men have also done better on target-directed motor skills such as guiding or intercepting projectiles and on disembedding tests where simple shapes are detected within more complex figures. There are also some tasks involving mathematical reasoning where men have been shown to outperform women (Kimura, 1992).

Psychological Theories of Gender Differentiation and Development

In addition to the physiologic makeup of individuals, each assumes a psychological perception of what it is to be male or to be female. Three major groups of theories are currently in favor to explain the development of the psychological sense of gender: social learning theories, cognitive and developmental theories, and information processing-schema theories. While Freudian theory of identification has faded somewhat, a feminist psychoanalytic theory does offer important considerations as do social structural hypotheses. For indepth discussion of

these theories, the reader is referred to Huston (1983).

The social learning theories, advanced by Bandura and Mischel, posit social, as opposed to organismic, bases for behavior. These theories explain sex-typing with observational learning and operant conditioning as major influences. Children observe behavior and its consequences in others and form expectancies for personal behavior, thus internal mental processes mediate behavior related to gender just as with any other trait. Bandura argues that the four processes of attention, retention, motor reproduction, and motivation influence the outcome of an observation. That is, a child attends to the gender of the model, then depending on the level of cognitive development the child codes the behavior. Enactment of a behavior depends also upon the child's ability to reproduce the behavior motorically and the child's motivation to reproduce the behavior. The latter process is mediated by the child's expectation depending upon both vicarious and direct reinforcement.

The cognitive and developmental theorists claim that both organismic (cognitive developmental level) and social/environmental factors form the basis for sex-typing. Kohlberg is most often cited as the leading proponent of this theory. A child organizes the world using gender as an organizing variable. Two major concepts are critical, including gender identity (a self-categorization as boy or girl) and gender constancy (understanding that gender does not change over time). Gender identity is typically acquired by age three and gender stereotypes become rigid between the ages of two and seven as gender constancy develops. Block proposed a developmental sequence for the acquisition of sex-role identity. In this theory, children pass from being self-centered and individualistic through several stages to becoming autonomous and self-aware. At the latter stages in this model masculine and feminine elements become integrated, or androgynous. Pleck and Rebecca et al. similarly propose a stage related view of sex-role development in which Kohlberg's stages of moral development are mirrored. First, a child is

undifferentiated in sex role and begins to learn expectations for boys and girls. Then sex roles become polarized and mutually exclusive. Finally, an indivdual reaches sex role transcendence in which the individual makes choices based on personal as opposed to societal values.

The information processing-schema theories have received a great deal of attention in the last decade. These theories are based on schemas which refer to a cognitive structure that consists of a set of expectations or a network of associations that serve to organize the individual's perception. Martin and Halverson describe stereotypes as schemas to organize social information. They believe that sex stereotypes are salient and used at two levels: 1) to evaluate if incoming information is appropriate to the individual (the individual's gender), and 2) to evaluate if incoming information is appropriate to the self. This theory suggests that people will have more completely developed schemas for gender appropriate topics. Bem claims that gender based schemas are important organizers, but also that for some people gender is a more salient variable

than for others. Her definition of androgyny differs from other authors in that she believes that highly sex-typed people have dominant gender schemas while androgynous people have less dominant schemas and a relative freedom from gender based judgements.

The newer psychoanalytic discussions include more emphasis on female development as well as issues such as breast envy and envy of childbearing capacity. These are hypothesized to occur because many children live in psychological matriarchies where issues of dependency and control must be negotiated. Theory suggests that sex differentiated roles can be reversed by shared male and female caretaking of young children.

Social structural hypotheses view the paternal role as the more important in the sex-typing of both girls and boys. The father is seen as the teacher of the male role for boys, but also the parent who responds in a mildly seductive way to girls, conveying the message that females are sexually attractive.

Cultural Factors

There are physiological and psychological factors to account for gender differences in boys and girls, but certainly sociological influences must also contribute to the overall development. Research supports the notion that behavioral attitudes do impact and make a difference. With the increased use of early diagnostic tests, the sex of unborn children is frequently known by the parents, families, and friends. Gender biased activities begin with decorating the nursery, buying color-coded clothing and sex-typed toys before the child is ever born. Attitudes are already forming just as the names are already chosen. Within hours of birth, parents begin to react differently, describing girls in more diminuitive terms, even though they may be the same size as the male newborns. Adults respond more quickly to a crying girl than a crying boy (Condry and Ross, 1985) perhaps influencing later levels of frustration tolerance and aggression. Interaction levels vary also. Campbell (1982) found that the less rigid fathers were in their own sex-role identification, the more they interacted with their children. There was also an

increase in the interaction if the infant was female.

Gender information is introduced through toys, sinlings, playmates, media, and books. Parents can therefore control to some extent how their children perceive or develop gender identification. Parents reward--or fail to reward--certain behaviors to increase or decrease their frequencies. By introducing certain toys to their children, parents may validate gender stereotypes (Katz, 1987). Miller (1987) found certain toys encourage and improve particular behaviors. She reported that blocks, tools, and balls may have improved spatial and creative abilities whereas tea sets, dolls, and stuffed animals encouraged nurturance.

Toddlerhood

As children develop between 12 and 36 months, information is often presented in gender fashion. Children are beginning to categorize and order their world and girl/boy input is readily available. The sexes are also being treated quite differently by those around them. It has been

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found that fathers engaged in more rough and tumble activities with their sons than daughters (Condrey and Ross, 1985) and both parents rewarded aggression in boys as early as 12 months of age (Fagot and Hagen, 1991)! More motor activities were reinforced in the boys and more communication efforts recognized and reinforced in the girls. Girls are seen more positively if they act in a more dependent and less self-directed manner.

Toys play a critical role at this stage, allowing children the opportunity to "practice" what they observe around them. The types of toys presented to girls and boys may have an impact on their development. Fagot, Leinbach, and Hagen (1986) found that there were more negative sanctions for boys not to play with girls' toys than for girls not to play with boys' toys. The boys also played longer with same sex toys. Children in mother-headed families seemed to have more awareness of stereotyped gender activities, but were also more flexible in choosing their toys (Brenes, Eisenberg, and Helmstadter, 1985). These studies seem to support that gender behavior may be modified.

Preschool

Whether at home or in child care, this period indicates a growing awareness of peers and socially acceptable behavior. Research indicated that once girls and boys became aware of gender differences, they separated themselves into same sex play groups (Fagot, Leinbach, and Hagen, 1986). Girls separated themselves first, but boys quickly followed (Maccoby and Jacklin, 1985). It is not yet understood if girls distance themselves from boys for protection, because of similar interests and verbal skills, encouraged by adults, or other factors. Interestingly, Maccoby and Jacklin (1985) found the more feisty girls as opposed to the more lady-like ones were more likely to choose other girls first as playmates.

Aggression in both sexes was also effected once children began to segregate themselves (Fagot, Leinbach, and Hagen, 1986). The level of aggression in girls decreased with adult expectations, but boys' aggression levels did not change. They were expected to be rowdier and they were. Aggression is readily identifiable by

children as young as three years of age and was the single most salient characteristic used by both boys and girls in judging their peers. Denham and McKinley (1990) found that each sex judged their same sex peers more positively and the opposite sex less so, but both sexes saw boys more negatively because of aggression. It may be important for adults to intervene as early as possible to channel this "aggressive" behavior into more appropriate activity, thus lessening the need for more restrictive interventions later.

Instructional Practices

Parents, evaluators, teachers, and caregivers have their own gender prejudices and treat children accordingly, sometimes without realizing the implications. Observers have documented that boys get more attention from teachers than girls. Leder (1991) noted that teachers were more accepting and verbally reinforcing of four year old boys' initiatives even if they were interrupting or disruptive. Encouraging higher male visibility at such an early age may set the stage for increased interactions later. Teachers

also tend to physically participate in female activities more than male (Wardle, 1991). They were less often in the block area or doing woodworking activities. Traditionally, teachers tend to reinforce quiet, cooperative, helpful, and passive behaviors and punish or ignore typical male behaviors. Wardle also found when female teachers became more involved with boys who were engaged in typical male activities, the amount and quality of play increased and disruptive behavior decreased. Male teachers also had a more positive effect on boys' behavior.

The more experience people have with preschoolers, the less tolerant they may be of aggressive-like behaviors, especially if displayed by girls. Condry and Ross (1985) noted that the sexes are judged differently in what constitutes aggression and the subsequent consequences. If teachers still prefer students who conform to gender role stereotypes and are more tolerant of aggression in boys, then why are so many boys referred for assessment for aggressive behaviors? More information and research are needed to investigate this area.

Implications

According to Wardle (1991), current preschool classroom materials and environment as well as teacher attitudes may meet the needs of girls better than boys. Locating unbiased curricular materials is difficult for teachers wishing to make changes. As long ago as 1984, Schau and Scott found that presenting more sex-equitable materials can effect at least some change and flexibility in children's attitudes as measured over time. Yet, order catalogues for classrooms continue to only offer stereotyped materials, reinforcing typical male/female roles in community workers, book themes, and toys. The media are strong influences on children, both at home and in the classroom. Television is especially influential in reinforcing traditional sex roles (Schau and Scott, 1984) and could easily be modified.

In the Classroom

Encouraging more typical male activities in the classroom may have positive outcomes for both sexes. Skills "learned by doing" may be remembered

better as neuro-pathways created by motor activities improve memory. At the very least, children who are moving around are more alert and open to learning. More movement requires more space, which is also beneficial to both sexes. Encouraging cross sex activities and providing more male props to centers may allow varied role playing and creativity. Most preschool classrooms have dress-up corners and housekeeping areas; they could be enhanced with "male" outfits, car tools, shovels, briefcases, tool belts, and tape measures improving accessibility for both sexes. Teachers can improve the quality of play, diminishing boredom and conflict, by providing additional play ideas (Shin and Spodek, 1991) and more male role models can positively effect behavior, especially in boys.

Summary

From the very beginning, the environment is acting on differently wired brains in boys and girls. There are physiological and biological gender differences and male vulnerability is a reality. There are also environmental and

societal factors contributing to early development which reinforce gender biased behaviors which may or may not always be in the child's best interest. Children learn their sexual identity, psychologically, at an early age.

It has been shown that gender is not an important variable in the measurement of intellectual abilities. Yet significantly more boys than girls continue to be placed in all mentally handicapping programs in this nation.

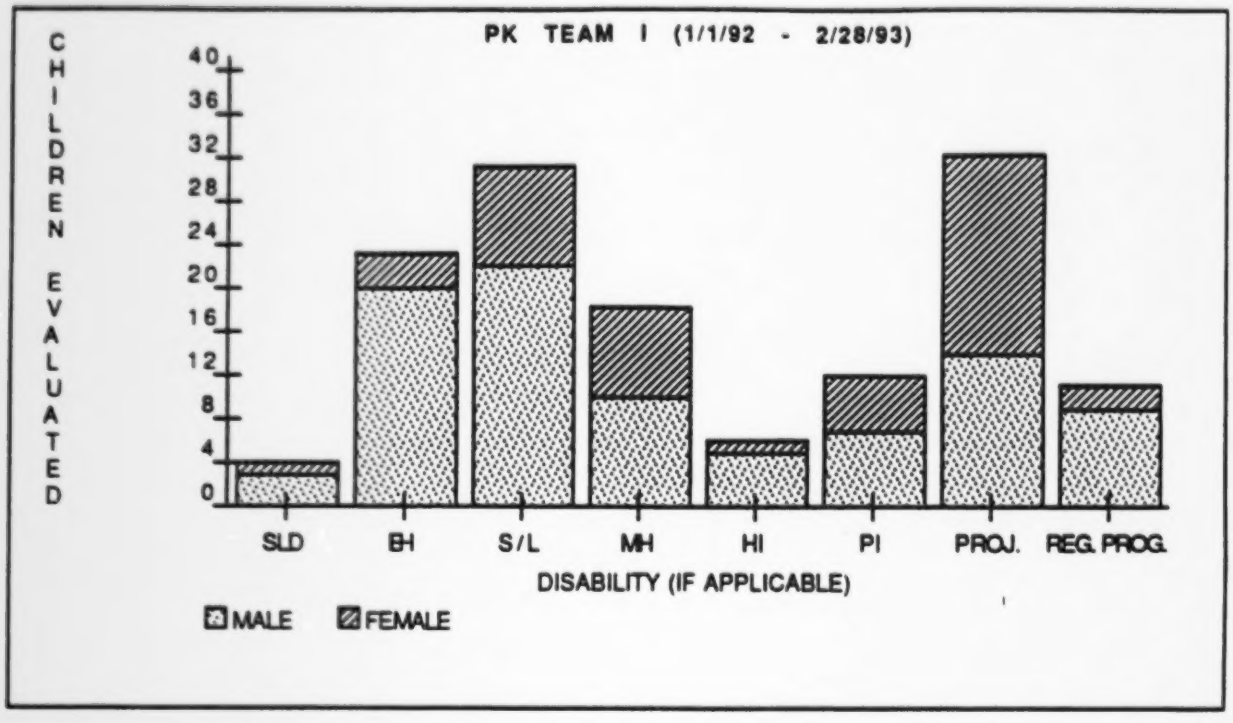
Sex differences in parental handling and societal attitudes seem to have a role in the identification and development of at least some of the behavioral and emotional disorders of children. It is not clear what the role of sex differences may play in adult conceptions of children, referral and labeling processes, or tolerance for deviant behaviors.

As assessors, teachers, or caregivers of young children, all of us must become more aware of these gender issues and strive to be more equitable in our treatment of young children. Before referring or placing a preschool child in

an exceptional education setting, some alternative educational strategies should be investigated.

It is very simplistic and reactive to assume that the over-identification of males in special education is only a result of a higher incidence of brain damage in males. A more proactive perspective would lead us to consider alternatives to special classroom placement as the first response to preschoolers who exhibit learning, language, or behavior problems. Adaptations in evaluation and instruction that take varying patterns of abilities, activity level, and related gender issues into consideration will produce more positive outcomes for young children, male and female, and their families.

Table 1


PK TEAM I (1/1/92 - 2/28/93)
CHILDREN EVALUATED
40
36
32
28
24
20
16
12
8
4
0
SLD
BH
S/L
MH
HI
PI
PROJ.
REG. PROG.
DISABILITY (IF APPLICABLE)
MALE
FEMALE

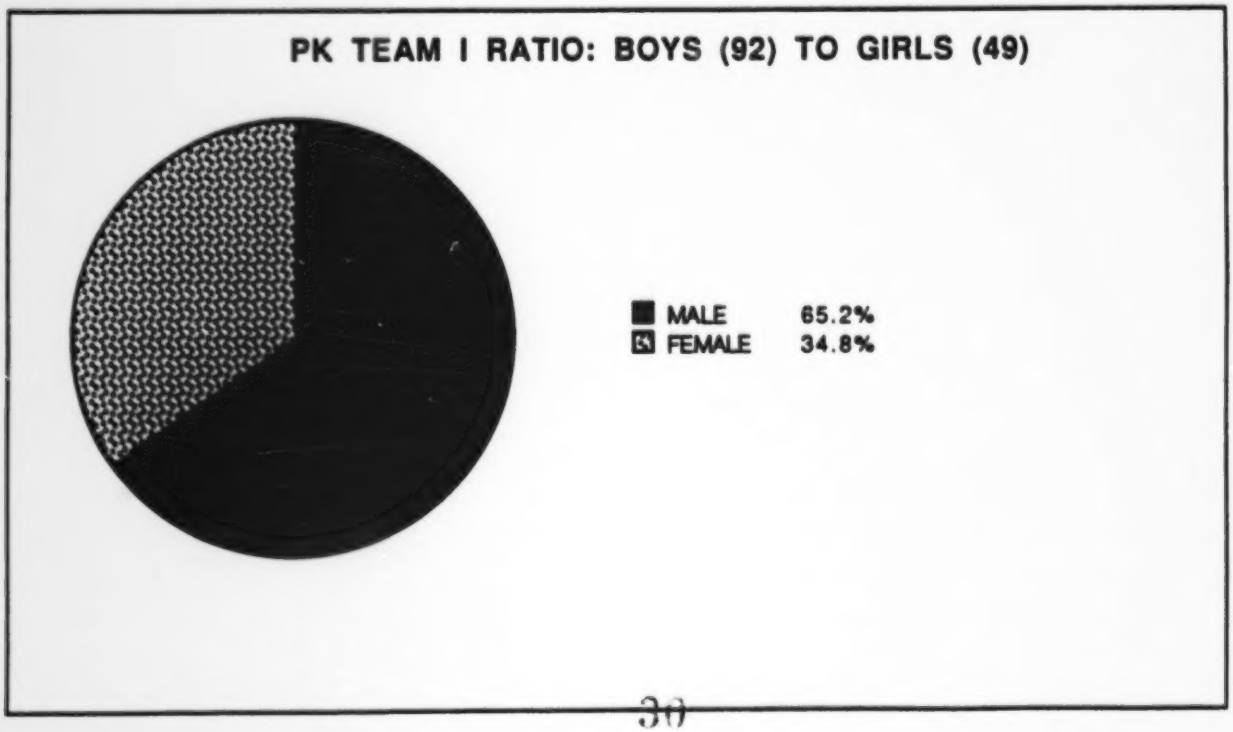
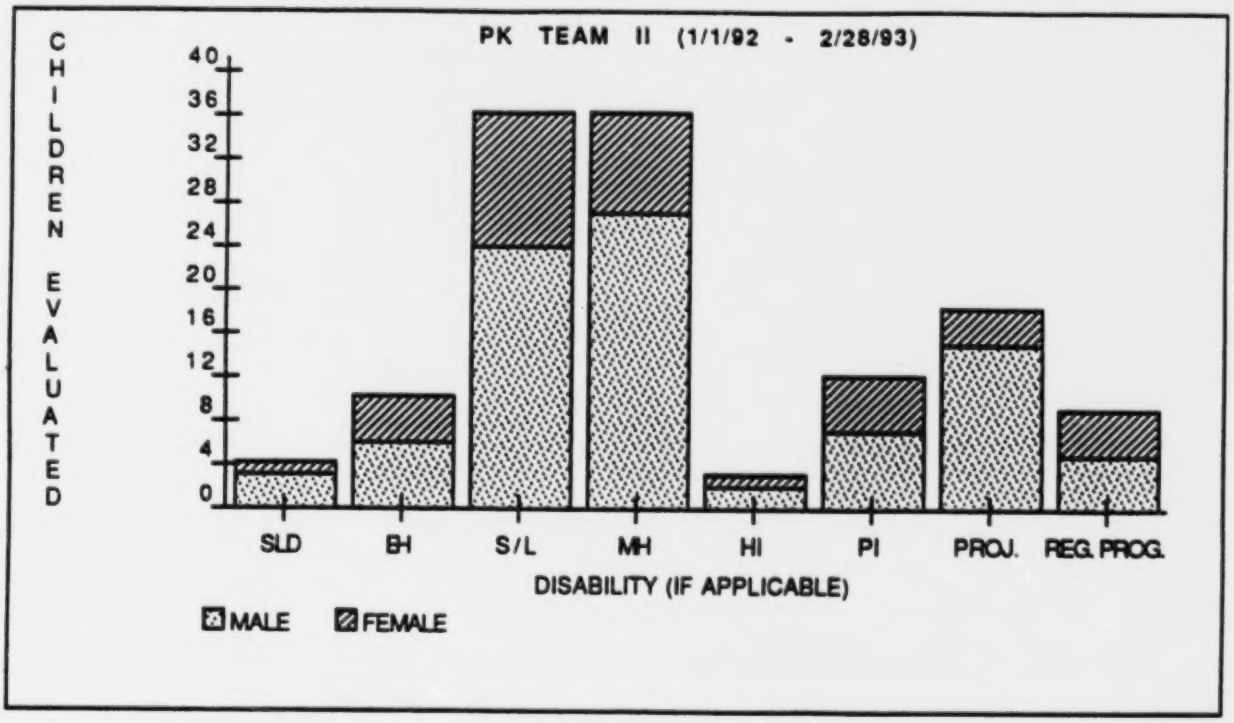

PK TEAM I RATIO: BOYS (92) TO GIRLS (49)
MALE 65.2%
FEMALE 34.8%

Table 2


PK TEAM II (1/1/92 - 2/28/93)
CHILDREN EVALUATED
40
36
32
28
24
20
16
12
8
4
0
SLD
BH
S/L
MH
HI
PI
PROJ.
REG. PROG.
DISABILITY (IF APPLICABLE)
MALE
FEMALE

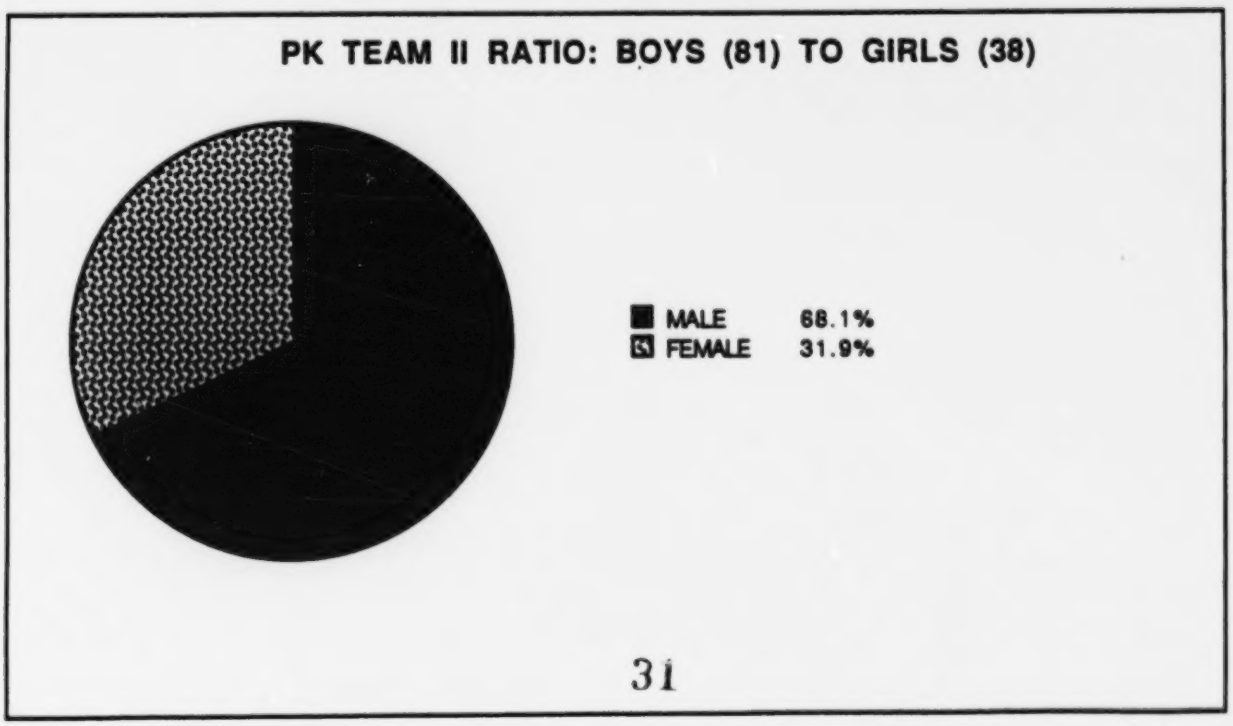
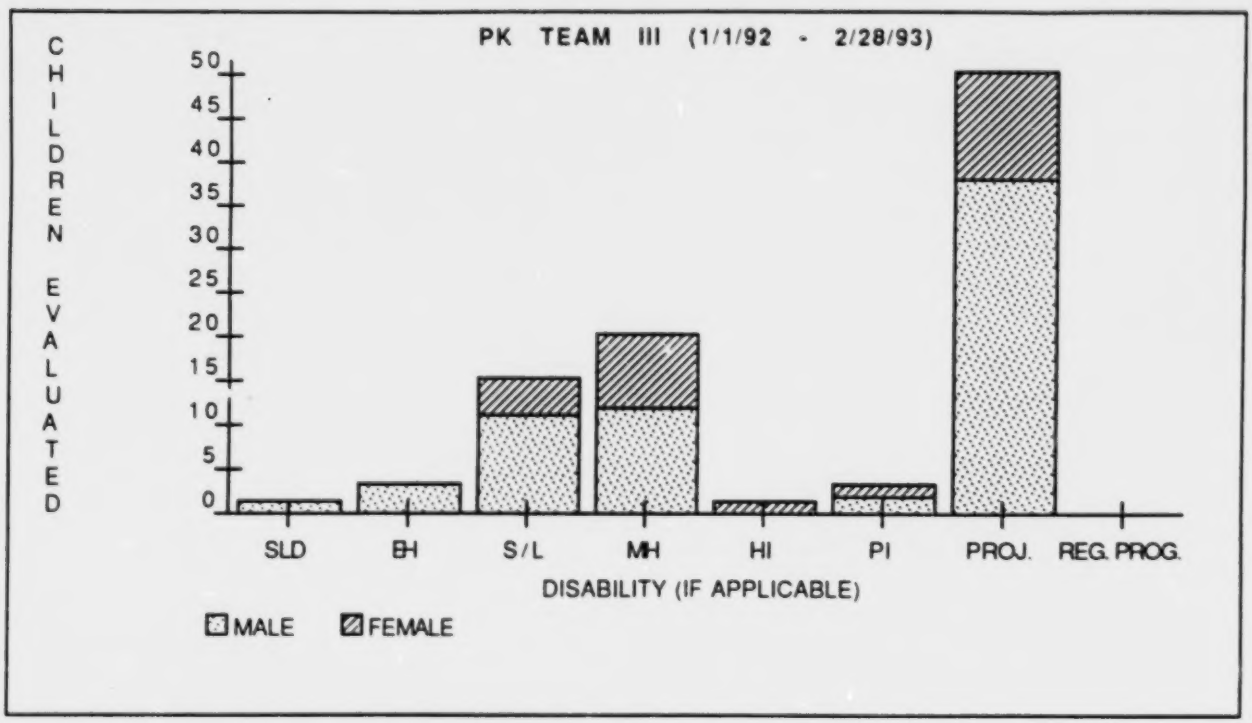
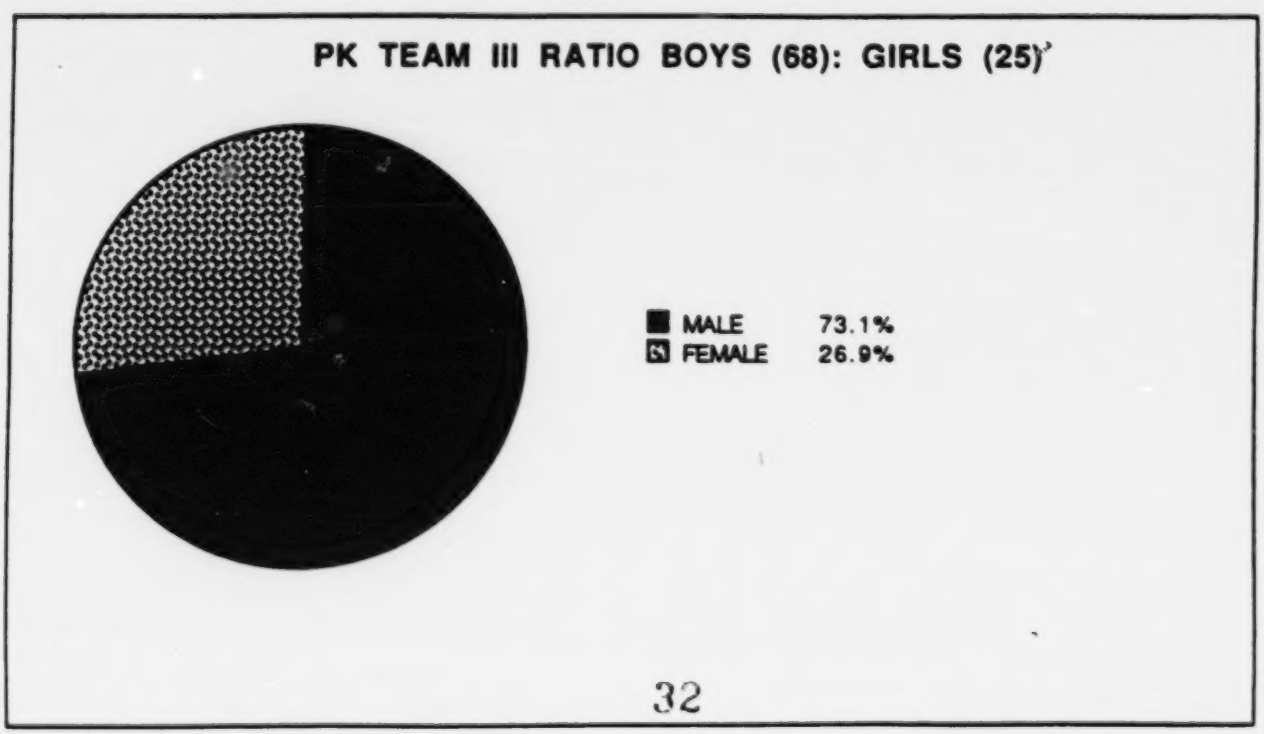

PK TEAM II RATIO: BOYS (81) TO GIRLS (38)
MALE 68.1%
FEMALE 31.9%

Table 3


PK TEAM III (1/1/92 - 2/28/93)
CHILDREN EVALUATED
50
45
40
35
30
25
20
15
10
5
0
SLD
EH
S/L
MH
HI
PI
PROJ.
REG. PROG.
DISABILITY (IF APPLICABLE)
MALE
FEMALE


PK TEAM III RATIO BOYS (68): GIRLS (25)
MALE 73.1%
FEMALE 26.9%

Annotated Bibliography

American Association of University Women. (1992). How schools shortchange girls: Executive summary. AAUW Education Foundation: Washington, D.C.

Summarizes the results and recommendations of the report prepared by the Wellesley College Center for Research on Women. Information is presented relative to what happens in classrooms, what is taught to students, math and science and females, tests, and dropping out. Forty specific recommentations for change are delineated.

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Attitudes, knowledge of sex-role stereotypes, and toy choices are compared in preschool boys and girls from single- and two-parent homes.

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Provides a discussion of how television portrayals of gender roles influence children's gender schemata. Content analyses of gender roles on television are described and a discussion of how schemata effect understanding of televsion as well as how television may activate and teach gender schemata is presented.

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Observers of tapes of preschool children charted interactions, perceptions, and levels of aggression. Correlation between levels of agressiveness and sex of the dyads is discussed.

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The authors explore the empirical relationships among gender schematization, children's knowledge and understanding of sex-role stereotypes, and preferences for sex-typed toys and memories for gender-relevant information. Sixty preschoolers between the ages of 33 to 68 months were interviewed.

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Observers of tapes of preschool children chart interactions, perceptions, and levels of aggression. Correlation between levels of aggression and sex of the dyads is discussed.

Cramer, P., & Skidd, J. E. (1992). Correlates of self-worth in preschoolers: The role of gender-stereotyped styles of behavior. Sex roles: A Journal of Research, 26, 369-90.

Using a story-completion method with 47 White middle-class preschoolers, the results of this study supported the hypotheses that gender-stereotyped styles of social interaction are apparent in the preschool years and the use of these gender-stereotyped behaviors is associated with the child's perceived competence and social support.

DeBold, J. F., & Luria, Z. (1983). Gender identity, interactionism, and politics: A reply to Rogers and Walsh. Sex Roles: A Journal of Research, 9, 1101-1108.

In a reply to Rogers and Walsh (Sex Roles, 1982, 8, 269-281), the authors disagree with some of the interpretations and criticisms of the psychomedical research in the development of sex differences. There is also a discussion of the reasoning and strategies of the biological approach in this research area.

Denham, S. A. (1990). Sociometric nominations of preschoolers: A psychometric analysis. ERIC Document Reproduction Service No. ED 326 310.

Sixty-three preschool children were studied over two years to determine if their judgement of peers' characteristics remained stable. Categories included popular, controversial, rejected, and isolated children. Same-sex and cross-sex nominations as well as age were examined.

Duveen, G., & Shields, M. (1986, Sept.). The social transmission of economic concepts. Paper presented at the Annual Developmental Conference of the British Psychological Society, Exeter, England.

A study of the development of representations of economic life in 110 young children of 3 to 5 years of age is reviewed to identify the sources of the children's representations. Findings indicated that representations of gender emerge as one of the principal means through which the developing child is able to assimilate features of economic life. Developmental processes are also cited as having significant influences.

Eaton, W. O. and Yu, A. P. (1989). Are sex differences in child motor activity level a function of sex differences in maturational status? Child Development, 60, 1005-1011.

The authors studied the relationships between activity levels and physical maturity of 83 five to nine year olds. The measure of maturity was percentage of estimated adult height attained. Direct caregiver observations were used to determine child activity levels. Females achieved greater relative maturity, greater maturity was associated with lower activity levels, and males were judged to be more active. Maturity did partially mediate sex influences on activity.

Emmerich, W. , & Shepard, K. (1984). Cognitive factors in the development of sex-typed preferences. Sex Roles, 11, 997-1007.

The authors studied 819 black and white children between the ages of 4 and 8 in order to answer the following three questions: 1) do both young black and young white children generally produce sex-stereotyped preferences; 2) do accurate attributions of sex-stereotyped preferences to the opposite sex develop at about the same time that children exhibit consistent sex-stereotyped preferences; and 3) is there evidence that the development of gender identity increases the value of one's own gender and others the same gender and perhaps decreases the value of the opposite sex?

Fagot, B. I., Leinbach, M. D., and Hagen, R. (1986). Gender labeling and the adoption of sex-typed behaviors. Developmental Psychology, 22, 440-443.

Children who were able to correctly identify gender were studied to predict the degree of aggression displayed in boys and girls. For girls, the level of aggression was diminished as they more clearly labelled gender roles. For boys, level of aggression remained the same. These results and environmental factors are discussed.

Fagot, B. I. and Hagan, R (1991). Observations of parent reactions to sex-stereotyped behaviors: Age and sex effects. Child Development, 62, 617-628.

In this study, the differential parental socialization of children is explored. The authors report the results of home observations of 92 12-month-olds, 82 18-month-olds, and 172 5-year-olds. Differences between mothers' and fathers' instruction and play interactions were noted.

Feingold, A. (1988). Cognitive gender differences are disappearing. American Psychologist, 43, 95-103.

An examination of gender differences by scores on a variety of aptitude measures using longitudinal data between 1947 and 1983 is presented. Standardized gender differences were averaged over grade of examiner and year of standardization to obtain a mean effect size for each ability. Gender differences declined precipitously over the years surveyed.

Grayson, D. A. (1987, April). Evaluating the impact of the Gender Expectations and Student Acheivement (GESA) Program. Paper presented at the Annual Meeting of the American Educational Research Association, Washington, DC.

Grayson discussed at length a study conducted in California that compared gender expectations of students, treatment of students by teachers, curriculum, materials, and learning environment and their effects on girls versus boys. A training module was then developed to help teachers be more responsive to all students. The results of a pilot study are also discussed.

Green, R., Neuberg, D. S., & Finch S. (1983). Sex-typed motor behaviors of "feminine" boys, conventionally masculine boys, and conventionally feminine girls. Sex Roles: A Journal of Research, 9, 571-79.

Four commonly discussed childhood behaviors (throwing a ball, walking, running, and telling a story) were observed and rated on a five-point scale to determine whether the gross impression conveyed by "feminine" boys is distinctive from that of conventional boys, and therefore in the direction of conventional girls. The etiology of gender identity disorder in childhood is discussed.

Gualtieri, T. & Hicks, R. E. (1985). An immunoreactive theory of selective male affliction. The Behavioral and Brain Sciences, 8, 427-441.

The authors propose a speculative theory that there is something about the male fetus that evokes an unhospitable uterine environment. This immunoreative theory is based upon sex ratios and negative parity effects in the occurrence of pregnancy complications and certain neurodevelopmental disorders. Twenty-three peer reviews are included.

Huston, A. C. (1983). "Sex-typing." in Mussen P. H. (Ed.) Handbook of Child Psychology, Fourth Edition, John Wiley and Sons, Inc.: New York, 387-468.

The author provides a comprehensive, in-depth summary of the research relating to sex-typing. Included are discussions of definition, theories, developmental changes, biological components, and socialization influences of the family and influences outside the family. A lengthy bibliography follows.

Jacklin, C. N. (1989). Female and Male: Issues of gender. American Psychologist, 44, 127-133.

Three areas of research where gender is or has been a primary focus of research are discussed: measurement of intellectual abilities, biology and behavior, and socialization processes. Policy implications are suggested.

Jacklin, C. N. et al. (1984). Neonatal sex-steroid hormones and muscular strength of boys and grils in the first three years. Developmental Psychology, 17, 301-310.

Describes a study where sex-steroid hormone levels are compared to three different strength measures and again between 6-33 months. A relationship between strength and two specific hormones, progesterone and androstenedione, is discussed.

Jacklin, C. N. & Maccoby, E. E. (1983). Neonatal sex-steroid hormones and timidity in 6-18 month old boys and girls. Developmental Psychology, 16, 163-168.

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Levels of five sex-steroid hormones, assayed in umbilical cord blood, are compared to measures of observed timidity in children 6-18 months of age. Marginal sex differences were found. A discussion of sex differences in emotionality is included.

Jacklin, C. N., Wilcox, K. T., & Maccoby, E. E. (1988). Neonatal sex-steroid hormones and intellectual abilities of six year old boys and girls. Developmental Psychology, 21, 567-574.

Levels of five sex-steroid hormones, assayed in umbilical cord blood, were compared to a variety of cognitive ability measures in a six year follow-up laboratory visit. The finding of a stable inverse association between sex and effect of hormones on abilities is discussed.

Jensen, M. A. (1983). Self-concept and its relation to age, family structure, and gender in Head Start children. Journal of Psychology, 113, 89-94.

A study of 92 Head Start children, utilizing the Piers Preschool Pictorial Self-Concept Scale, is presented. Results indicated the relationships between scaled scores and age, family structure, or gender were negligible. Specific items of the scale, however, were found to be sensitive to family structure and gender differences.

Katz, P. A. (1987). Variations in family constellation: Effects on gender schemata. New Directions for Child Development, 38, 39-56.

Katz reviews the research on antecedents of gender schema variability with an emphasis on family socialization variables. Distal and proximal family variables are discussed. Distal variables include demographic and structural characteristics of families and proximal variables include familial socialization variables such as parental attitudes, personality, and child-rearing techniques.

Kimura, D. (1992). Sex differences in the brain. Scientific American, 267, 119-125.

Provides a review of research on behavioral, neurological and endocrinologic studies of those processes giving rise to sex differences in the brain, suggesting that men's and women's brains are organized along different lines from very early in life.

Knapp, C. E. (1985). Escaping the gender trap: The ultimate challenge for experiential educators. Journal of Experiential Education, 8, 16-19.

Knapp argues that adults are caught in sex-roles and respond in stereotypical patterns. The author promotes androgeny as a method of avoiding a gender trap. He also advocates equalizing the number of qualified male and female role models, raising gender consciousness, and respecting biological gender differences.

Kuczynski, L. et al. (1989, April). Development of children's noncomplicance strategies from toddlerhood to age 5. Paper presented at the National Bienniel Meeting of the Society for Research in Child Development, Kansas City, MO.

The authors studied 51 parent-child dyads. Children ranged in age from one and a half to three and a half at the first observation and all were age five at second observation. Dyads were videotaped in a naturalistic apartment setting and children's strategies for resisting maternal control were examined.

Larche, D. (1985). Father Gander Nursery Rhymes. The Advocacy Press: Santa Barbara, CA.

A collection of gender equitable nursery rhymes (variations of the originals).

Leder, G. C. (1991, April). Early school experiences: Gender differences in mathematics learning. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Two four-year-olds, one male and one female, were monitored during their first formal exposure to math. Because past research had indicated that teachers respond more frequently to boys and because girls often avoid math and related fields, early experiences were studied.

Levy, G. D. (1989a). Developmental and individual differences in preschoolers' recognition memories: The influences of gender schematization and verbal labeling of information. Sex Roles: A Journal of Research, 21, 305-324.

Levy reports the results of interviews with children aged 37 to 92 months. Assessed were children's gender schematization and recognition memories for gender-typed content. Specific results are reported for children's memories of gender-role consistent and gender-role inconsistent items.

Levy, G. D. (1989b, April). Gender schematization and gender scripts: Sometimes a little knowledge can be dangerous. Paper presented at the Biennial Meeting of the Society of Research in Child Development, Kansas City, MO.

Provides a review of the results of several studies regarding developmental and individual differences between aspects of gender-based information. Discussed are concepts such as gender schematic processing, recognition memories for gender-typed information, as well as flexibility, sequencing, and gender script understanding.

Levy, G. D. (1989c, April). Preschool children's knowledge of gender-related scripts and schemata. Paper presented at the 60th Annual Meeting of the Eastern Psychological Association, Boston, MA.

Data for 40 preschoolers aged 43 to 78 months were reported with relation to age and gender script interpretation.

Levy, G. D., & Carter, D. B. (1989). Gender schema, gender constancy, and gender-role knowledge: The roles of cognitive factors in preschoolers' gender-role stereotype attributions. Developmental Psychology, 25, 444-49.

The authors report the results of a study in which 83 27- to 63-month-old children were interviewed regarding their gender constancy development and gender-role knowledge and flexibility. In addition, children's toy preferences and gender schematization were assessed.

Levy, G. D., & Dykes, K. C. (1990, May). Cognitive, social, and behavioral correlates of the gender schema: Relations and implications. Paper presented at the 62nd Annual Meeting of the Midwestern Psychological Association, Chicago, IL.

The authors discuss the effects of age and gender on stereotyped behaviors. The older children possessed more knowledge of gender information, but the youger children seemed more flexible. Differences between sexes and implications are examined.

Liben, L. S., & Bigler, R. S. (1987). Reformulating children's gender schemata. New Directions for Child Development, 38, 89-105.

Provides a discussion of the reformulation of gender schemata. Reformulation in psychological theory, reformulation of gender schemata resulting from interventions to reduce gender typing, and reformulations of intervention strategies based on cognitive-developmental theory are addressed.

Maccoby, E. E. , & Jacklin, C. N. (1985, April). Gender segregation in nursery school: Predictors and outcomes. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Toronto, Canada.

Preschool children's play groups were examined. Sex segregated groups were formed early without teacher prompting. It was hypothesized that these same-sex groups may serve a positive function in socialization. Implications and suggestions for interventions are discussed.

Malorzo, L. (1985, March). Gender identity and the development of personal space in young children. Paper presented at the Annual Meeting of the Eastern Psychological Association, Boston, MA.

Personal space and gender identity development of 3, 5, and 7 year old children were examined. Same sex and opposite sex distance preferences were determined to be a factor of age and gender.

Martin, C. L., & Halverson, C. F. (1983). Gender constancy: A methodological and theoretical analysis. Sex Roles: A Journal of Research, 9, 775-790.

The authors reported the results of an inquiry into the presence of gender constancy in a sample of 26 white middle class children ranging in age from 53 to 78 months. Assessments included both a perceptual transformation task and a verbal task. The authors cautioned that children may tend to respond as if pretending which may distort results.

Meece, J. L. (1987). The influence of school experiences on the development of gender schemata. New Directions for Child Development, 38, 57-73.

Provides a review of the research on sex differences in teacher attitudes, classroom interactions, instructional practices, peer interactions, and other experiences to show the influence of schools on the development and enactment of gender schemata in elementary and secondary schools.

Miller, C. L. (1987). Qualitative differences among gender-stereotyped toys: Implications for cognitive and social development in girls and boys. Sex Roles, 16, 473-87.

Describes results of 100 adult subjects' ratings of 50 children's toys on 12 "functional" dimensions. Toys considered appropriate for girls and those considered appropriate for boys differed in many ways. The classification system may be helpful in assessing relationships among sex-typed toy play and the development of differential cognitive and/or social skills in girls and boys.

Mischel, W. (1970). "Sex-typing and socialization" in Mussen, P. H. (Ed.) Carmichael's Manual of Child Psychology, third edition, John Wiley and Sons, Inc., New York, 3 - 72.

This chapter provides an excellent (albeit dated) overview of the processes children undergo in becoming psychological males or females. In addition, theoretical, methodological, and empirical limitations and difficulties are discussed.

Mullis, R. L., & Bornhoeft, D. M. (1983). Sex-role orientation and cognitive functioning in young children. Journal of Psychology, 113, 17-23.

Forty-eight preschoolers aged three (N=24) and five (N=24) were studied to determine whether sex-role orientation influences measures of cognitive ability. Findings suggested that sex-role orientation was not related to cognitive functioning. No sex differences were found in performance of Piagetian and spatial tasks. Interestingly, and contrary to expectations, picture vocabulary test standard scores were higher for males than females at both ages three and five and higher for both boys and girls at age five.

Office of Special Education and Rehabilitative Services. (1992). Implementation of the Individuals with Disabilities Education Act: Fourteenth annual report to Congress. Washington, DC. Division of Innovation and Development.

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Summarizes the detailed results of the 14th annual report to Congress with respect to the Individuals with Disabilities Education Act (IDEA). Chapter One provides information on numbers and characteristics of students receiving special education and related services. Chapter Two focuses on early childhood activities and discusses the implementation of part H of IDEA. Chapter Three examines the transition of disabled youth from secondary school to early adulthood. Chapter Four descibes efforts to assist state and local education agencies.

Rave, E. J., & Hannah, G. L. (1985a, Aug.). Gender and ethnic effects in describing toddler behavior. Paper presented at the 93rd annual Convention of the American Psychological Association, Los Angeles, CA.

Explores performer and respondent gender and ethnicity as variables in labelling toddler behavior.

Rogers, L. J. (1983). Hormonal theories for sex differences--Politics disguised as science: A reply to DeBold and Luria. Sex Roles: A Journal of Research, 9, 1109-1113.

The authors propose an argument for consideration of cultural factors in explaining sex differences in human behavior. Criticisms of psychomedical research that claims to provide evidence for hormonal causations of sex differences are presented.

Schau, C. G., & Scott, K. (1984). Impact of gender characteristics of instructional materials: An integration of the research literature. Journal of Educational Psychology, 76, 183-193.

Reviews the available literature regarding gender specified and unspecified language in instructional materials. Extensive discussion of results with lengthy summary of implications and recommendations are provided.

Segal, J. (1983, April). Parental cognitive commitment to the sex of the child. Paper presented at the 54th Annual Meeting of the Eastern Psychological Association, Philadelphia, PA.

Discusses the perceptions of mothers and fathers regarding sex stereotyped behaviors or traits in their newborn sons and daughters.

Serbin, L. A., & Sprafkin, C. (1986). The salience of gender and the process of sex typing in three-to-seven-year-old children. Child Development, 57, 1188-1199.

The relationship and developmental sequences of sex-role knowledge and gender-based classification are examined. The variables of learning history and environmental factors are discussed as critical in making personal choices and decisions about gender dimensions in a study of boys and girls ages 3-7.

Shin, E. and Spodek, B. (1991, April). The relationship between children's play patterns and types of teacher intervention. Paper presented at the Annual Conference of the American Educational Research Association, Chicago, IL.

The authors report the results of a study in which 10 preschool teachers were observed interacting with their 74 boys and 73 girls. Using an event sampling procedure, an observer recorded nine types of teacher intervention during children's social and cognitive play in four different play arenas.

Signorella, M. L. (1987). Gender schemata: Individual differences and context effects. New Directions, 38, 23-37.

Provides a discussion of types of gender schemata and methods of assessment relating to gender-schematic processing measures, gender knowledge, and gender identity measures. Notes the need to focus on individual differences in children's gender schemata and to identify procedures that will reduce highly stereotyped children's biased information processing.

Stoddart, T., & Turiel, E. (1985). Children's concepts of cross-gender activities. Child Development, 56, 1241-1252.

Concepts of gender differentiation in children and adolescents (5-13 years) as well as their domain-specific social judgements were examined. Results revealed a pattern of U-shaped behavioral growth with young children and adolescents viewing the crossing of gender boundaries as more wrong than children in middle childhood.

Tavris, C. (1992). The Mismeasure of Woman. Touchstone, New York: NY.

Presents a well-researched, easy to read, and provocative discussion of gender differences.

U. S. Bureau of the Census. Statistical Abstracts of the United States: 1992. (112th Edition.) Washington, DC, 1992.

Provides statistics related to demographic counts and trends in the United States.

Wardle, F. (1991, May/June). Are we shortchanging boys? Exchange, 48-51.

Wardle discusses statistics about boys and girls with special needs from a Head Start population and provides some information about biological evidence regarding maturational rates for boys and girls. An excellent list of needed teacher characteristics is provided.

Wehren, A., & DeLisi, R. (1983). The development of gender understanding: Judgments and explanations. Child Development, 54, 1568-1578.

Ten males and ten females each at ages 3, 5, 7, and 9 were interviewed to assess self gender constancy and other gender constancy. Gender stability preceeded gender constancy.

Weintraub, M. (1984). The development of sex role stereotypes in the third year: Relationships to gender labeling, gender identity, sex-typed toy preference, and family characteristics. Child Development, 55, 1493-1503.

Results are discussed of sex and age differences in preschoolers. Gender identity, gender labelling, sex-typed toy preferences, and awareness of adult sex role differences as well as environmental factors are examined.